

## **Solutions of general second order ODEs using direct block method of Runge-Kutta type**

### **ABSTRACT**

This paper presents a three point block variable step size method of Runge-Kutta type for solving general second order ordinary differential equations (ODEs). The block method is formulated using Lagrange interpolation polynomial. Most of the mathematical problems which involve higher order ODEs could be reduced to system of first order equations. The proposed method obtains the numerical solutions directly without reducing to first order systems of ODEs. The method is used to compute the solutions at three points simultaneously by integrating the coefficients over the closest point in the block. The stability region of the block method is also studied. The numerical results obtained shows that the proposed method is more efficient compared to existing block methods in terms of total steps and execution time.

**Keyword:** Block method; Variable step size; Ordinary differential equations